

CLAIMS

1. A method for inducing arterial morphology in a vein, comprising:
contacting endothelial cells in said vein to at least one polynucleotide encoding a gene that is capable of inducing endothelial remodeling for a time sufficient to transfer the polynucleotide into the endothelial cells.
2. The method of claim 1, wherein said vein is a mammalian vein.
3. The method of claim 1, wherein the vein is a human vein.
4. The method of claim 3, wherein the vein is a saphenous vein.
5. The method of claim 1, wherein the gene encodes *endoglin*, *Alk-1* or both.
6. The method of claim 1, wherein the gene encodes one or more of *ephrin-B2*, *EphB4*, *elastin* and *CD34*.
7. The method of claim 1, wherein the polynucleotide is contained within an expression vector adapted to introduce the polynucleotide into the cells.
8. The method of claim 7, wherein the expression vector is a viral vector.

9. The method of claim 8, wherein the viral vector is an adenoviral vector, a herpesviral vector, a pox viral vector, or an adeno-associated viral vector.

10. A method of treating a patient having an obstructed blood vessel, comprising:

providing a graft comprising endothelial cells;

contacting the endothelial cells of the graft to at least one polynucleotide encoding a gene that is capable of inducing endothelial remodeling for a time sufficient to transfer the polynucleotide into the endothelial cells;

removing a section of said obstructed blood vessel; and

grafting the graft in place of the removed section of said obstructed blood vessel.

11. The method of claim 10, wherein providing a graft comprises harvesting a section of a vein from said patient.

12. The method of claim 11, wherein the vein is a saphenous vein of said patient.

13. The method of claim 10, wherein the gene encodes *endoglin*, *Alk-1*, or both.

14. The method of claim 10, wherein the gene encodes one or more of *ephrin-B2*, *EphB4*, *elastin* and *CD34*.

15. The method of claim 10, wherein the polynucleotide is contained within an expression vector adapted to introduce the polynucleotide into the cells.

16. The method of claim 15, wherein the expression vector is a viral vector.

17. The method of claim 16, wherein the viral vector is an adenoviral vector, a retroviral vector, a herpesviral vector, a pox viral vector, or an adeno-associated viral vector.

18. A blood vessel, comprising endothelial cells comprising an exogenously supplied polynucleotide encoding a gene that is capable of inducing endothelial remodeling in the endothelial cells.

19. A blood vessel in accordance with claim 18, wherein the vessel is a section of a mammalian vein.

20. A blood vessel in accordance with claim 19, wherein the vessel is a section of a human vein.

21. A blood vessel in accordance with claim 20, wherein the vessel is a section of a saphenous vein.

22. A blood vessel in accordance with claim 18, wherein the gene encodes *endoglin*, *Alk-1* or both.

23. A blood vessel in accordance with claim 18, wherein the gene encodes one or more of *ephrin-B2*, *EphB4*, *elastin*, and *CD34*.

Approved for Release